

## **Four new *Perania* (Araneae: Tetrablemmidae, Pacullinae) from Thailand and Malaysia**

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**Four new *Perania* (Araneae: Tetrablemmidae, Pacullinae) from Thailand and Malaysia.** - Four new *Perania* species are described, *P. nasicornis* from northern Thailand, *P. siamensis* from southern Thailand, *P. cerastes* and *P. coryne* from peninsular Malaysia. Interspecific relationships are discussed, notes on natural history are given.

**Key-words:** Araneae - Tetrablemmidae - *Perania* - Southeast Asia - Taxonomy.

### INTRODUCTION

Spiders of the genus *Perania* Thorell, 1890, the largest representatives among the armoured spiders (Tetrablemmidae), have only rarely become available for taxonomic studies. Following THORELL's early records of 1890 (*P. nigra*, *P. picea*) and 1898 (*P. birmanica*), HOGG (1920) described *P. korinchica* from the prosoma of a single female, which LEHTINEN (1981) later assigned to *P. picea*. It was not until quite recently that more substantial material was discovered in northern Thailand (SCHWENDINGER 1989; *P. nasuta*, *P. robusta*). Consecutive collecting has brought forth several more specimens from different parts of Thailand and, for the first time, also from Malaysia. An additional pair of these spiders from Malaysia was kindly left at my disposal by Mr. Joseph Koh (Singapore). It has now become quite obvious that *Perania* is by no means as rare as previously assumed. Attentive search, especially in mountainous regions, will most likely reveal further species from Southeast Asia. Because of their apparent diversity in the mountains, it is by no means improbable that Hogg's *P. korinchica*, from a different mountain than *P. picea*, is indeed a distinct species.

ABBREVIATIONS: CTh Collection Thaler, Innsbruck; MCSNG Museo Civico di Storia Naturale, Genova; MHNG Muséum d'Histoire naturelle, Genève; NHMW Natur-

historisches Museum, Wien; ALE, PME, PLE anterior (posterior) median (lateral) eyes. All measurements are in mm.

**Perania nasicornis** sp. n. (Figs 1-14)

**H o l o t y p e** ♂: Thailand, Lamphun Province, Mae Tha District, Doi Khuntan National Park, 1250 m, 16 February 1992; MHNG.

**P a r a t y p e s**: From the type locality, 3 ♂, 1200-1300 m, 16 February 1992; 3 ♂, 4 ♀, 1000 m, 8 October 1992; MHNG, NHMW. All specimens leg. Schwendinger.

**C o m p a r a t i v e m a t e r i a l**: *Perania nasuta* Schwendinger, 1 ♂, 1 ♀ paratypes; CTh.

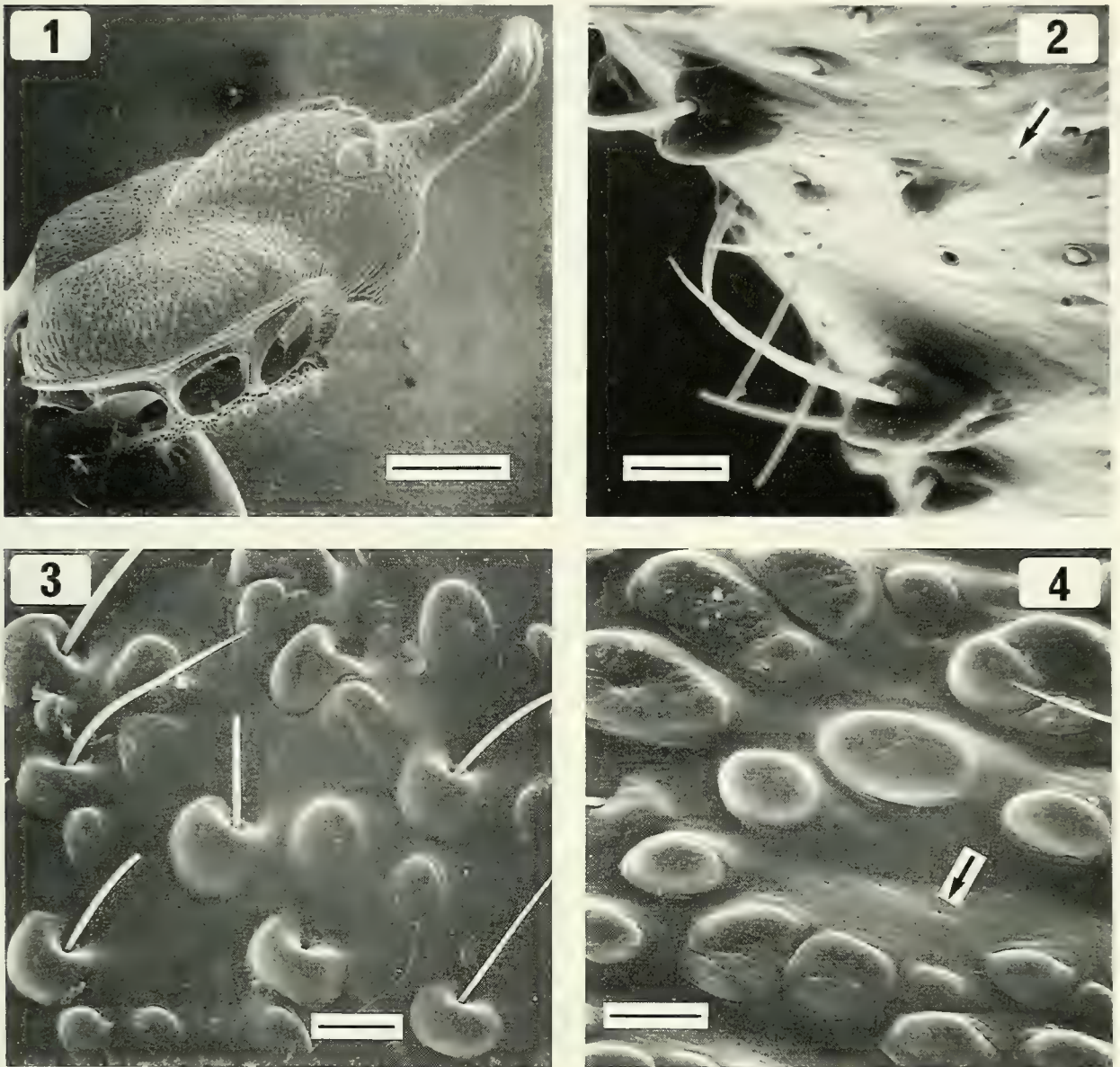
**E t y m o l o g y**: Latin: *nasus* = nose, *cornu* = horn, antlers. Adjective; referring to clypeal process of males.

**D i a g n o s i s**: Closely related to *P. nasuta*, males distinguished by a longer and distally broader clypeal process; embolus shorter, distally more scoop-shaped; sub-terminal lamella reaching apex. Females without cone-shaped lateral sclerites on posterior abdomen; vulva with spermathecae (receptacula seminis) widening in posterior portion, bearing only few gland pores.

**D e s c r i p t i o n**:

**MALE** (holotype). Colour: sclerotised parts dark brown, membranous parts of abdomen orange-brown. Cuticle of carapace, including clypeal process, and legs penetrated by scattered pores (Figs 2, 4, see arrows). Possibly pheromone-emitting gland pores, as present in some lycosids (KRONESTEDT 1986). Total length, including clypeus process, 10.9. Carapace 6.4 long, 2.7 wide; pars cephalica covered with wart-like hair bases (Fig. 3), pars thoracica with cowdung-shaped tubercles lacking setae (Fig. 4). Spatulate median process rising from clypeus forwards and slightly upwards (Figs 1, 5-8). Fovea indistinct, longitudinal. Six oval eyes in three groups; laterals on common low tubercle, medians sessile. Eye sizes and interdistances: PME 0.23 long, separated by 0.14; ALE 0.21 long, ALE-PLE 0.11; PLE 0.23 long, separated by 1.11. Chelicerae without modifications. Labium 0.7 long, 1.0 wide. Sternum 2.6 long, 1.8 wide, fused to carapace and covered with warts as on cephalic region. Legs 1243. About 10-15 short spicules (conical hair bases; Fig. 2) proventrally and ventrally on metatarsus I, 20-25 in distal half of ventral tibia I. Paired leg claws with a row of 13-15 teeth on anterior legs, 9-12 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	4.6	3.5	2.6	3.4	1.2
Patella	1.7	1.4	1.1	1.2	0.6
Tibia	4.3	3.3	2.3	3.1	1.1
Metatarsus	3.0	2.6	2.2	3.0	—
Tarsus	1.4	1.2	0.9	1.0	1.0
Total	15.0	12.0	9.1	11.7	3.9

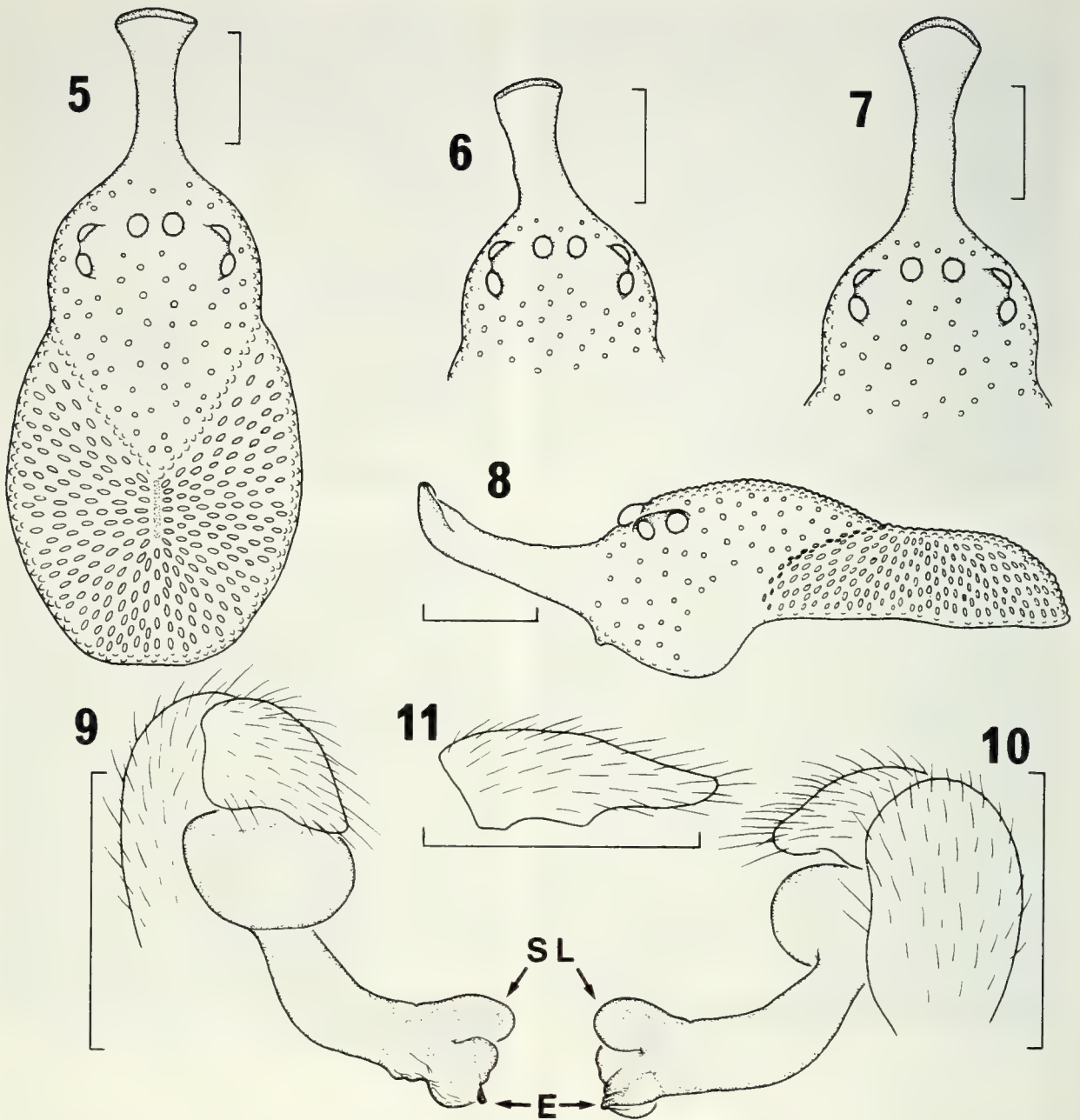


FIGS 1-4

*Perania nasicornis* sp. n. SEM micrographs of male. Prosoma, dorsolateral view (1). Conical hair bases on tibia I, ventral view (2). Wart-like hair bases on pars cephalica of carapace, dorsal view (3). Cowdung-shaped tubercles on pars thoracica, dorsal view (4). Presumed gland pores indicated by an arrow on Figs 2, 4. Scale lines 1.0 mm (1) and 50  $\mu$ m (2-4).

Cymbium with short stout apex (Fig. 11), as in *P. nasuta*. Bulb small. Embolus large and bent, its apex scoop-shaped and broadly truncate; subterminal dorsal lamella (SL) and tip of embolus (E) at the same level (Figs 9, 10).

Abdomen 4.9 long, 3.0 wide. Dorsal scutum oval, 4.3 long, 2.9 wide, quite smooth, with only indistinct mosaic of low tubercles. Lateral sclerites in posterior half of abdomen not wart-like and not interconnected. Pulmonary plate 3.2 long, 2.5 wide, fused to spiracular plates; genital region flat. Postgenital plate reduced to a pair of paramedian patches. Preanal plate 0.3 long, 1.1 wide. Anal plate 1.0 long, 1.3 wide.



FIGS 5-11

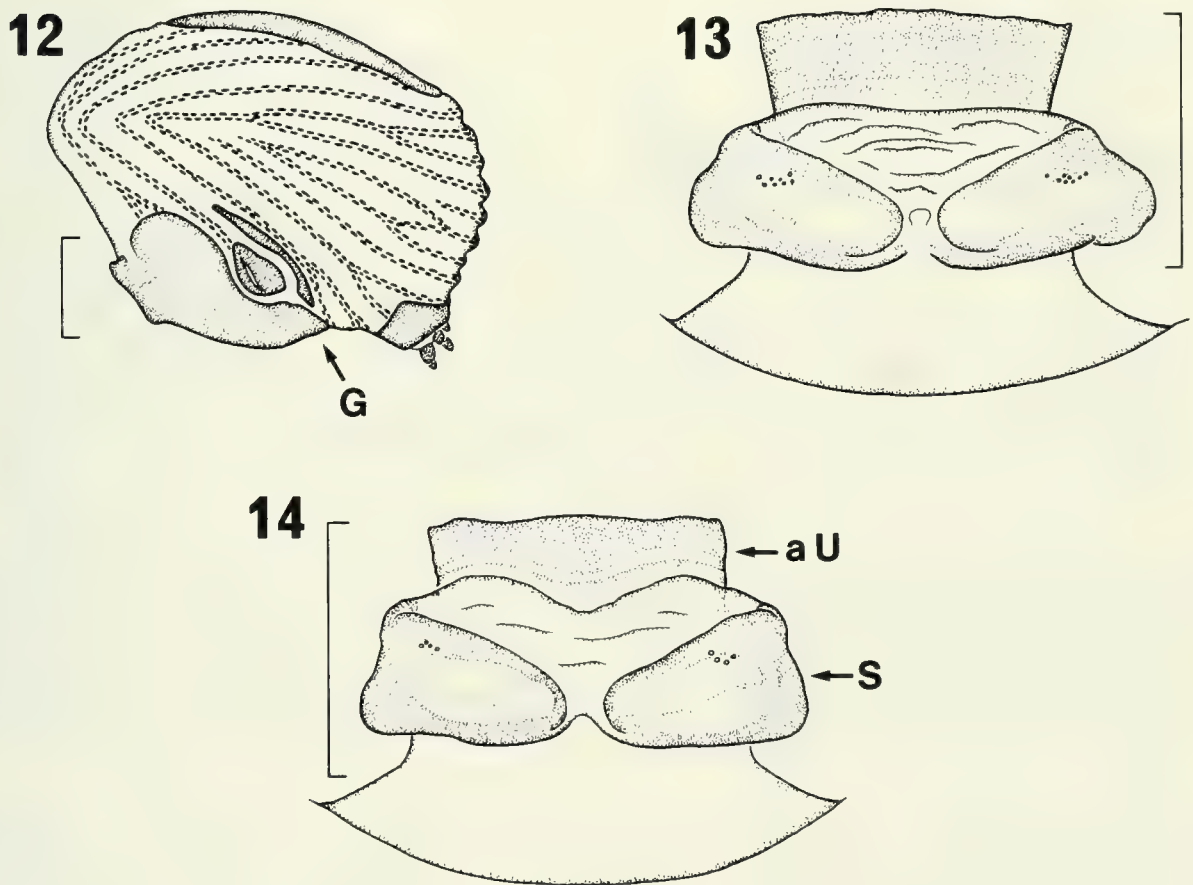
*Perania nasicornis* sp. n., male. Holotype (5, 8-11). Carapace, dorsal view (5). Clypeal process of two male paratypes (6, 7). Carapace, lateral view (8). Palp, prodorsal view (9), retrodorsal view (10). Cymbium prolateral view (11). E tip of embolus, SL subterminal lamella. Scale lines 1.0 mm.

**FEMALE.** As in the male, except for the following. Total length 7.6. Carapace 3.9 long, 2.4 wide; pars cephalica raised and arched, without clypeal process. PME 0.23 long, 0.21 apart; ALE 0.21 long, ALE-PLE 0.09; PLE 0.21 long, 1.28 apart. Labium 0.6 long, 1.0 wide. Sternum 2.2 long, 1.7 wide. Legs 1423; tibia and metatarsus I without spicules. Paired leg claws with a row of 11-13 teeth on anterior legs, 9-10 on posterior legs; unpaired claw with one denticle. Palpal tarsus without claw. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	3.2	2.9	2.3	2.9	0.8
Patella	1.3	1.1	1.0	1.0	0.5
Tibia	3.0	2.5	1.8	2.5	0.7
Metatarsus	2.3	2.2	1.9	2.5	—
Tarsus	1.2	1.2	0.9	1.1	1.1
Total	11.0	9.9	7.9	10.0	3.1

Abdomen 4.4 long, 3.0 wide; few of the lateral sclerites in the posterior half wart-like but not interconnected as in females of *P. robusta* Schwendinger. Dorsal scutum 3.1 long, 2.0 wide. Pulmonary plate 2.1 long, 2.2 wide, completely separated from spiracular plates; genital region (G) short and almost flat (Fig. 12). Postgenital plate and preanal plate reduced to pairs of paramedian patches. Anal plate 0.8 long, 1.1 wide.

Vulva with fairly long anterior collar (aU, i.e. anterior uterus externus) and a pair of triangular spermathecae (S) close to each other, posteriorly widest, with only few gland pores (Figs 13, 14).



FIGS 12-14

*Perania nasicornis* sp. n., female. Abdomen, lateral view (12). Vulvae of two specimens, ventral view (13,14). G genital region of pulmonary plate, aU anterior collar of uterus externus, S spermathecae. Scale lines 1.0 mm (12) and 0.5 mm (13, 14).

**Variation:** Carapace measurements range: ♂: length 5.0-6.4, width 2.4-2.7 (n=8); ♀: length 3.8-4.1, width 2.4-2.6 (n=4). Clypeal process of variable length (Figs 5-7); one male with a short oblique, apparently malformed process (Fig. 6).

**Distribution:** Known only from Doi Khuntan National Park, northern Thailand (Fig. 43: 4).

**Natural history:** *Perania nasicornis* sp. n. occurs in evergreen hill forest between 1000-1300 m altitude. In open pine forest above and in dry dipterocarp forest below this zone they were not found. Humid conditions seem to be required. As in the other species from Thailand (SCHWENDINGER 1989) they ambush upside down in a loose, wide-meshed sheet web at night and hide in a retreat, connected to the web, during daytime. The exo-skeleton of a male (used for SEM-micrographs) was taken from the sheetweb of a *Psechrus* (Psechridae). It seemingly has entered the wrong web and fallen prey to the larger spider.

**Remark:** Measurements of the female abdomen of *P. nasuta* in the original description (SCHWENDINGER 1989: 576) are wrong. Micrometer units were erroneously given instead of millimeters. It should read: abdomen 5.1 long, 3.3 wide.

### ***Perania siamensis* sp. n.**

(Figs 15-25)

**Holotype** ♂: Thailand, Ranong Province, about 4 km east of Ranong, on the road to Had Sompae, 50 m, 18 September 1992; MHNG.

**Paratypes:** 1 ♂, 3 ♀, same data as for the holotype; MHNG, NHMW.

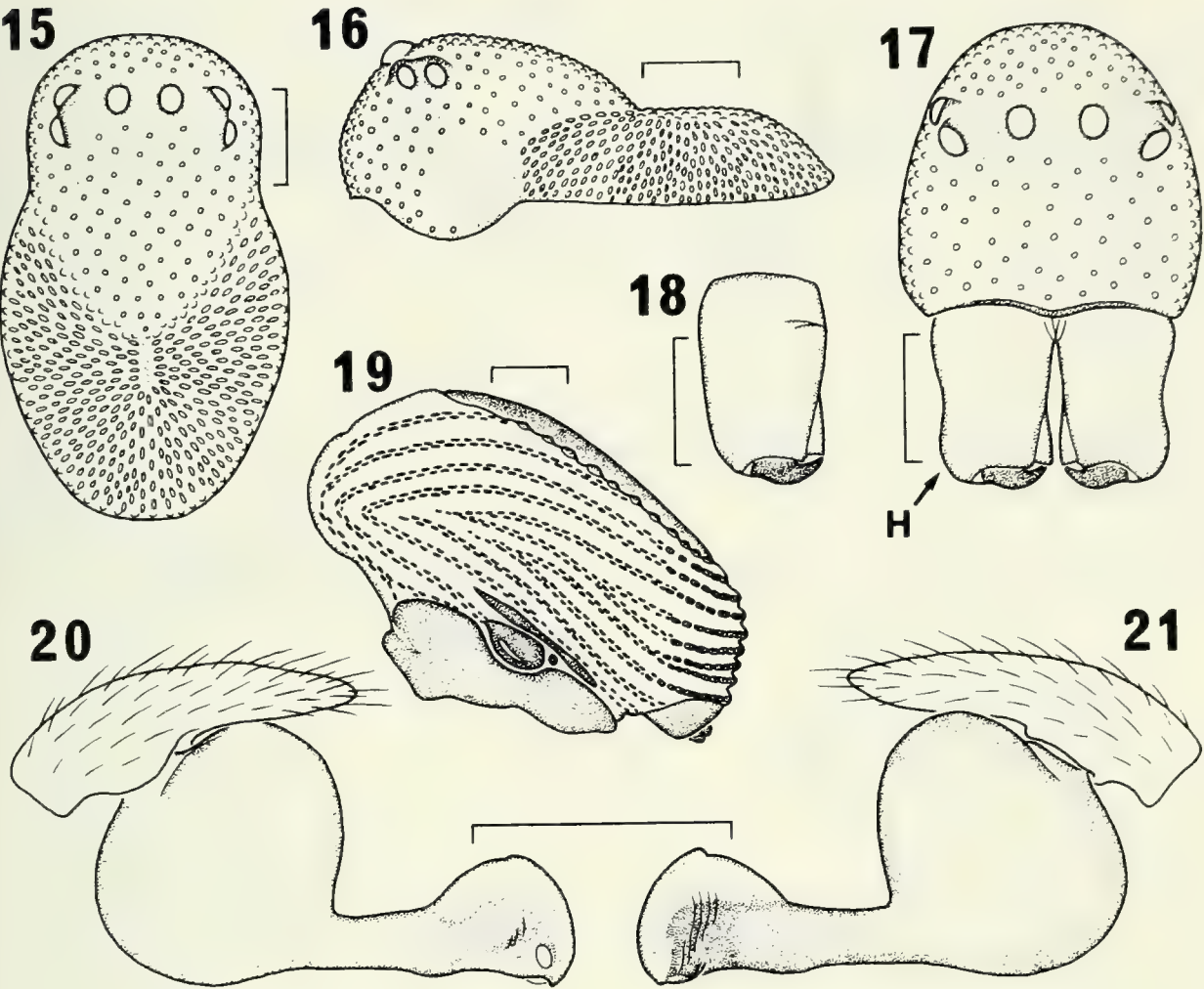
**Other material:** Prachuab Khiri Khan Province, Thap Sakae District, Huay Yang National Park, 1 ♂, 3 ♀, 700 m, 29 November 1991; 1 ♀, 1 juv., 550 m, 16 September 1992; 1 ♀, 550 m, 22 December 1992. Ranong Province, Kapoe District, Khlong Nakha Wildlife Sanctuary, 30 m, 3 ♀, 1 juv., 29 January 1991; 1 ♀, 7 December 1991. Krabi Province, Khao Phanom District, Khao Phanom Bencha National Park, 260 m, 1 ♂, 4 ♀, 22 September 1992; MHNG, NHMW. All specimens leg. Schwendinger.

**Comparative material:** *Perania robusta*, 1 ♂ paratype, 2 ♂, 3 ♀, from the type locality; MHNG, NHMW, CTh.

**Diagnosis:** Close to *P. robusta*, males distinguished by a smaller distolateral hump on chelicerae; less spicules on tibia and metatarsus I; bulb more inflated; tip of embolus broad and truncate. Females with small cone-shaped sclerites along lateral margins of dorsal scutum; pulmonary plate longer and distinctly bulged in genital region; vulva with larger, almost adjoining spermathecae. Dorsal scutum in both sexes more strongly sculptured.

### **Description:**

**MALE.** Colour: sclerotised parts dark brown, membranous parts of abdomen orange-brown. Total length 9.5. Carapace 4.8 long, 3.1 wide, without clypeal process (Figs 15, 16); pars cephalica distinctly raised and arched, as in females. Six eyes, laterals on common tubercle. Eye sizes and interdistances: PME 0.26 long, separated by 0.34; ALE 0.26 long, ALE-PLE 0.17; PLE 0.26 long, separated by 1.57. Chelicerae with a



FIGS 15-21

*Perania siamensis* sp. n. Male (15-17, 20, 21), female (18, 19). Carapace dorsal view (15), lateral view (16). Carapace and chelicerae, frontal view (17). Right chelicera, frontal view (18). Abdomen, lateral view (19). Palp, prolateral view (20), retrolateral view (21). H lateral hump. Scale lines 1.0 mm.

small retrolateral hump (H) at distal corner (Fig. 17). Labium 0.9 long, 1.1 wide. Sternum 2.9 long, 1.9 wide. Legs 1423. About 10 fairly long proventral and ventral spicules on metatarsus I, 5 short ones in distal half of proventral tibia I. Paired leg claws with a row of 14-15 teeth on anterior legs, 9-11 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	4.9	3.9	3.2	4.0	1.3
Patella	1.7	1.5	1.2	1.3	0.6
Tibia	5.0	3.7	2.5	3.5	1.2
Metatarsus	3.2	2.8	2.4	3.3	—
Tarsus	1.2	1.2	1.1	1.1	1.4
Total	16.0	13.1	10.4	13.2	4.5

Cymbium with long apex, as in *P. robusta*. Bulb large, globular. Embolus axe-shaped, with wide truncate apex, lacking a separate subterminal dorsal lamella (Figs 20, 21).

Abdomen 5.0 long, 3.6 wide. Dorsal scutum oval, 4.3 long, 2.9 wide, with mosaic of low tubercles in a median line and paramedian curved cuticular folds, more distinct than in *P. nasicornis* sp. n. Pulmonary plate 3.4 long, 2.8 wide, fused to spiracular plates; genital region flat. Postgenital plate reduced to a small pair of patches. Preanal plate 0.3 long, 1.0 wide. Anal plate 1.0 long, 1.4 wide.

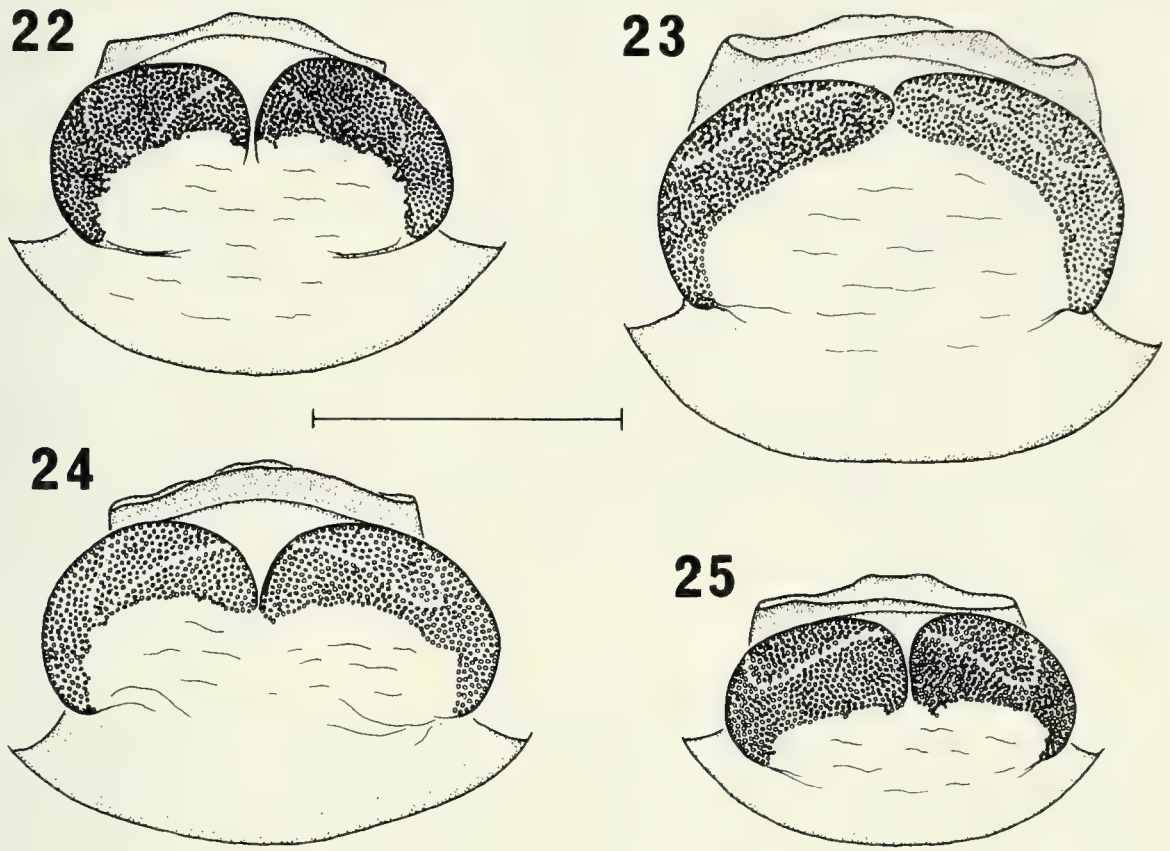
FEMALE. As in the male, except for the following. Total length 9.7. Carapace 4.8 long, 3.1 wide. PME 0.29 long, 0.24 apart; ALE 0.29 long, ALE-PLE 0.08; PLE 0.29 long, 1.67 apart. Chelicerae without disto-lateral hump (Fig. 18). Labium 0.9 long, 1.2 wide. Sternum 2.6 long, 2.0 wide. Legs 14=23; tibia and metatarsus I without spicules. Paired leg claws with a row of 13-15 teeth on anterior legs, 10-12 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	4.4	3.6	3.0	3.6	1.2
Patella	1.6	1.5	1.2	1.3	0.6
Tibia	4.3	3.4	2.3	3.3	0.9
Metatarsus	3.1	2.7	2.3	3.2	—
Tarsus	1.5	1.4	1.1	1.2	1.4
Total	14.9	12.6	9.9	12.6	4.1

Abdomen 6.4 long, 4.6 wide, with cone-shaped lateral sclerites along both sides of dorsal scutum and on posterior face of abdomen; small sclerites posteriorly interconnected. Dorsal scutum 4.0 long, 2.9 wide. Pulmonary plate 3.1 long, 2.9 wide, separated from spiracular plates; genital region long and distinctly bulged (Fig. 19). Postgenital plate and preanal plate reduced to pairs of paramedian patches. Anal plate 0.9 long, 1.3 wide.

Vulva wide, with large rounded spermathecae, little separated or adjoining, bearing large crescent-shaped patches of gland pores (Figs 22-25).

JUVENILES. The smaller juvenile (carapace length 1.25, width 0.94) from Khlong Nakha lacks carapace sculpture and distinct abdominal plates. Sclerotisation on abdomen developed only in a posteriorly broken ring around anus and spinnerets and in a small ventral plate behind the petiolus. The larger juvenile (carapace length 3.16, width 2.13) from Huay Yang already has the typical warty carapace surface but still lacks a fully developed abdominal sclerotisation. Dorsal scutum absent, small rounded sclerites present in that area instead; anal plate still broken by a narrow posterior gap; pulmonary plate separated into ventral sclerotisation behind petiolus, rounded plates above book lungs, smaller ones in genital region (equivalent to paired depressions in adults) and spiracular plates.



FIGS 22-25

*Perania siamensis* sp. n., vulvae of four females, ventral view. Specimen from Ranong (22), from Huay Yang (23), from Khao Phanom Bencha (24), from Khlong Nakha (25). Scale line 1.0 mm.

**V a r i a t i o n :** Carapace measurements range: ♂: length 4.9-5.4, width 3.0-3.3 (n=4); ♀: length 4.1-5.2, width 2.6-3.3 (n=16). The four females from Khlong Nakha are distinctly smaller than all others, carapace length 4.1-4.2, width 2.6-2.7, whereas the smallest specimen from the other localities measures 4.6 and 3.0 respectively. No significant differences in genitalia can be recognized (Figs 22-25). Specimens from Huay Yang with quite smooth dorsal scutum. Males from Khao Phanom Bencha and from Huay Yang with more (5-7) spicules on tibia I.

**D i s t r i b u t i o n :** Widely distributed at low altitudes (30-700 m) in southern Thailand. Most northern and most southern populations separated by about 380 km (Fig. 43: 5-8).

**N a t u r a l h i s t o r y :** All spiders were found in humid evergreen forests. Webs have the typical thin, wide-meshed sheet, running into a retreat in the soil or in decaying logs. A few webs had dead ants, one remnants of an opiloidid (Laniatores) stored in the retreat.

Egg clusters are semi-globular, flat on top and spun together by fine threads. They are suspended inside the retreat and contain 38 (Ranong, 18 September) and 59

(Khao Phanom Bencha, 22 September) purple-brown eggs (becoming light green in alcohol) of 1.22-1.34 mm diameter.

**Perania cerastes** sp. n.

(Figs 26-34)

**H o l o t y p e** ♂ : Malaysia, Perak State, Taiping, Maxwell Hill (= Gunung Larut), 1200 m, 5 February 1991; MHNG.  
**P a r a t y p e s** : 2 ♂, 2 ♀, same data as for the holotype; MHNG, NHMW. All specimens leg. Schwendinger.

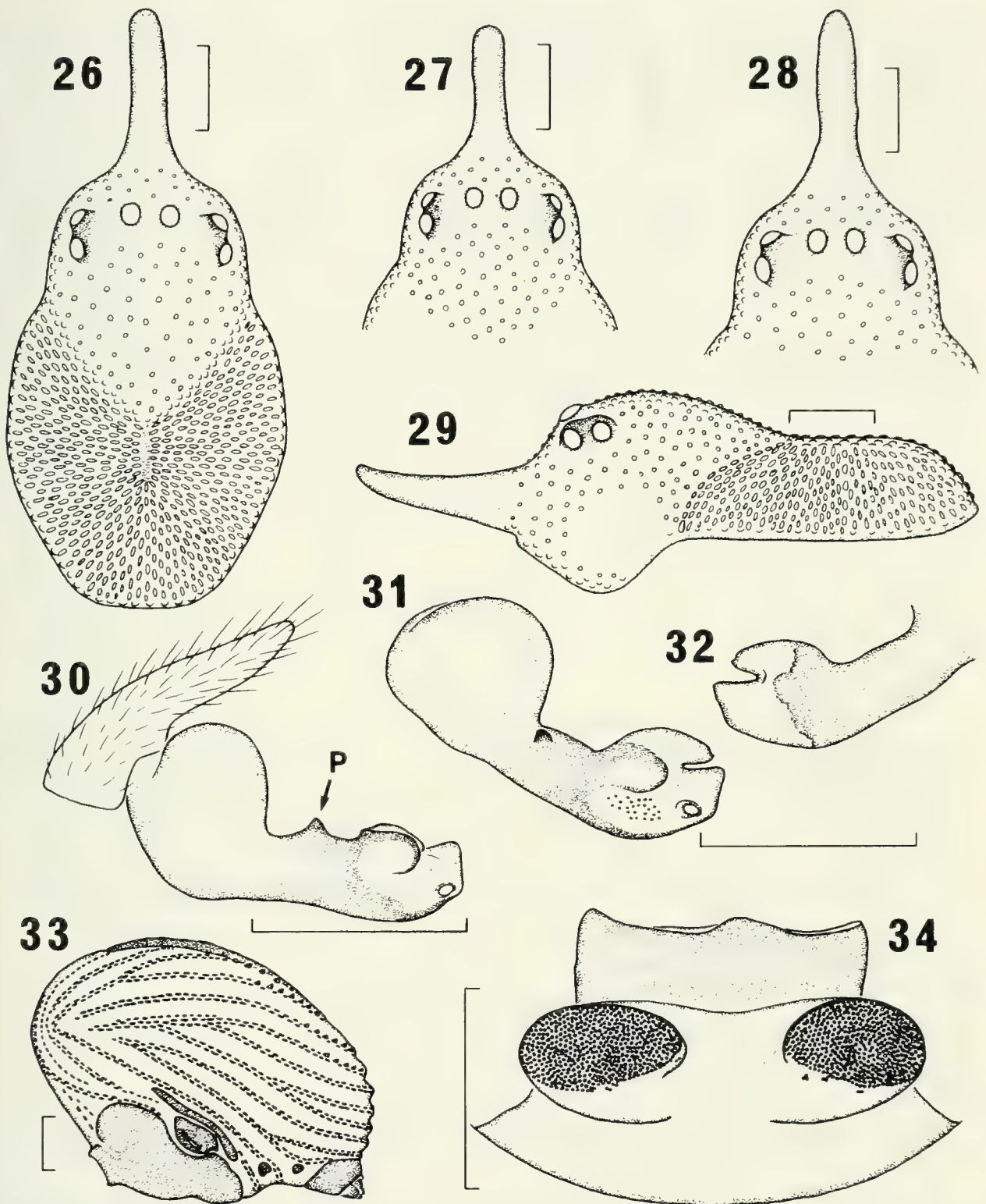
**E t y m o l o g y** : Greek: *kerastes* = horned; referring to clypeal process of males.  
**D i a g n o s i s** : Resembling *P. nasuta* and *P. nasicornis* sp. n. Males distinguished by: digitiform clypeal process; numerous spicules on tibia and metatarsus I; tooth-like process on dorsal ledge of embolus. Females with wide vulvae, bearing rounded, widely separated spermathecae.

**D e s c r i p t i o n :**

**MALE** (holotype). Colour: sclerotised parts dark reddish-brown, distal joints of posterior legs slightly lighter; membranous parts of abdomen orange-brown. Total length, including clypeal process, 11.9. Carapace 6.8 long, 3.3 wide. Clypeal process smooth and digitiform, occupying about 1/4 of carapace length (Figs 26-29). Eye sizes and interdistances: PME 0.29 long, separated by 0.21; ALE 0.23 long, ALE-PLE 0.17; PLE 0.29 long, separated by 1.49; lateral eyes on common low tubercle. Chelicerae without modifications. Labium 1.0 long, 1.2 wide. Sternum 3.1 long, 2.2 wide. Legs 1423. About 50 short spicules of various sizes proventrally and ventrally on metatarsus I, about 20 on proventral tibia I. Paired leg claws with a row of 12-15 teeth on anterior legs, 9-10 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	5.9	4.5	3.8	4.7	1.2
Patella	2.2	1.7	1.4	1.5	0.6
Tibia	5.7	4.3	3.1	4.2	1.2
Metatarsus	3.8	3.4	3.0	3.9	—
Tarsus	1.8	1.6	1.2	1.3	1.4
Total	19.4	15.5	12.5	15.6	4.4

Cymbium with long apex. Bulb with broad embolus, bearing a tooth-like process (P) on its dorsal ledge (Fig. 30); apex bifurcate, composed of scale-like subterminal lamella and obliquely truncate embolus tip (Figs 31, 32). A subterminal rounded boss, with a patch of pit-like depressions below, present on prolateral face of embolus (Fig. 31).



FIGS 26-34

*Perania cerastes* sp. n. Male (26-32), female (33, 34). Holotype (26, 29). Carapace, dorsal view (26). Clypeal process of two paratypes, dorsal view (27, 28). Carapace, lateral view (29). Palp, prolateral view (30). Bulb, prodorsal view (31). Embolus, retrodorsal view (32). Abdomen, lateral view (33). Vulva, ventral view (34). P dorsal process. Scale lines 1.0 mm (26-33) and 0.5 mm (34).

Abdomen 5.7 long, 3.6 wide, lateral sclerites in posterior half not wart-like and not interconnected. Dorsal scutum 4.8 long, 3.0 wide, with mosaic of low tubercles and ridges. Pulmonary plate 3.3 long, 3.0 wide, fused to posterior part of spiracular plates; genital region flat. Postgenital plate reduced to a pair of patches. Preanal plate 0.3 long, 1.2 wide. Anal plate 1.2 long, 1.5 wide.

FEMALE. As in the male, except for the following. Total length 10.1. Carapace 4.9 long, 3.2 wide; pars cephalica raised and arched, without clypeal process. PME 0.30 long, 0.23 apart; ALE 0.26 long, ALE-PLE 0.18; PLE 0.27 long, 1.68 apart. Labium 1.0 long, 1.3 wide. Sternum 3.0 long, 2.2 wide. Legs 1423; about 50 small spicules on metatarsus I (also present but less distinct in females of *P. robusta*), tibia I without. Paired claws with a row of 14-16 teeth on anterior legs, 11-12 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	5.3	4.3	3.4	4.3	1.3
Patella	1.9	1.6	1.2	1.4	0.6
Tibia	4.8	3.7	2.6	3.6	1.0
Metatarsus	3.6	3.1	2.7	3.7	—
Tarsus	1.7	1.5	1.2	1.4	1.5
Total	17.3	14.2	11.1	14.4	4.4

Abdomen 6.2 long, 5.0 wide; several lateral sclerites in posterior half wart-like but not interconnected. Dorsal scutum 4.3 long, 2.8 wide. Pulmonary plate 3.1 long, 3.0 wide, completely separated from spiracular plates; genital region bulged (Fig. 33) but not elongated as in *P. siamensis* sp. n. Postgenital plate and preanal plate reduced to pairs of paramedian patches. Anal plate 1.4 long, 1.2 wide.

Vulva with anterior collar narrower than the pair of widely separated rounded spermathecae, which bear large ovoid patches of gland pores. Entire posterior part of vulva slightly sclerotised (Fig. 34).

V a r i a t i o n : Carapace measurements range: ♂ : length 6.1-7.1, width 3.0-3.3 (n=3); ♀ : length 4.7-4.9, width 3.1-3.2 (n=2). Clypeal processes vary only slightly in length and shape (Figs 26-28).

D i s t r i b u t i o n : Known only from Maxwell Hill, peninsular Malaysia (Fig. 43: 9).

N a t u r a l   h i s t o r y : The spiders were collected at a roadside in montane rain forest. As in all other *Perania*, they can be seen outside the retreat, hanging upside down in the sheetweb, during their nocturnal ambush.

**Perania coryne** sp. n. (Figs 35-42)

H o l o t y p e ♂ : Malaysia, Pahang State, Cameron Highlands, 14-20 April 1990, leg. V. & B. Roth, don. J. Koh; MHNG.

**Paratype** ♀ : Same data as for the holotype; MHNG.

**Etyymology** : Greek: *koryne* = club, cudgel. Noun in apposition; referring to shape of male clypeal process.

**Diagnosis** : Closely related to *P. cerastes* sp. n., male distinguished by a club-shaped clypeal process; embolus distally narrower and rounded, without dorsal tooth; subterminal lamella small. Female with massive chelicerae; spermathecae little separated and narrower than anterior collar; poreplates small.

### Description:

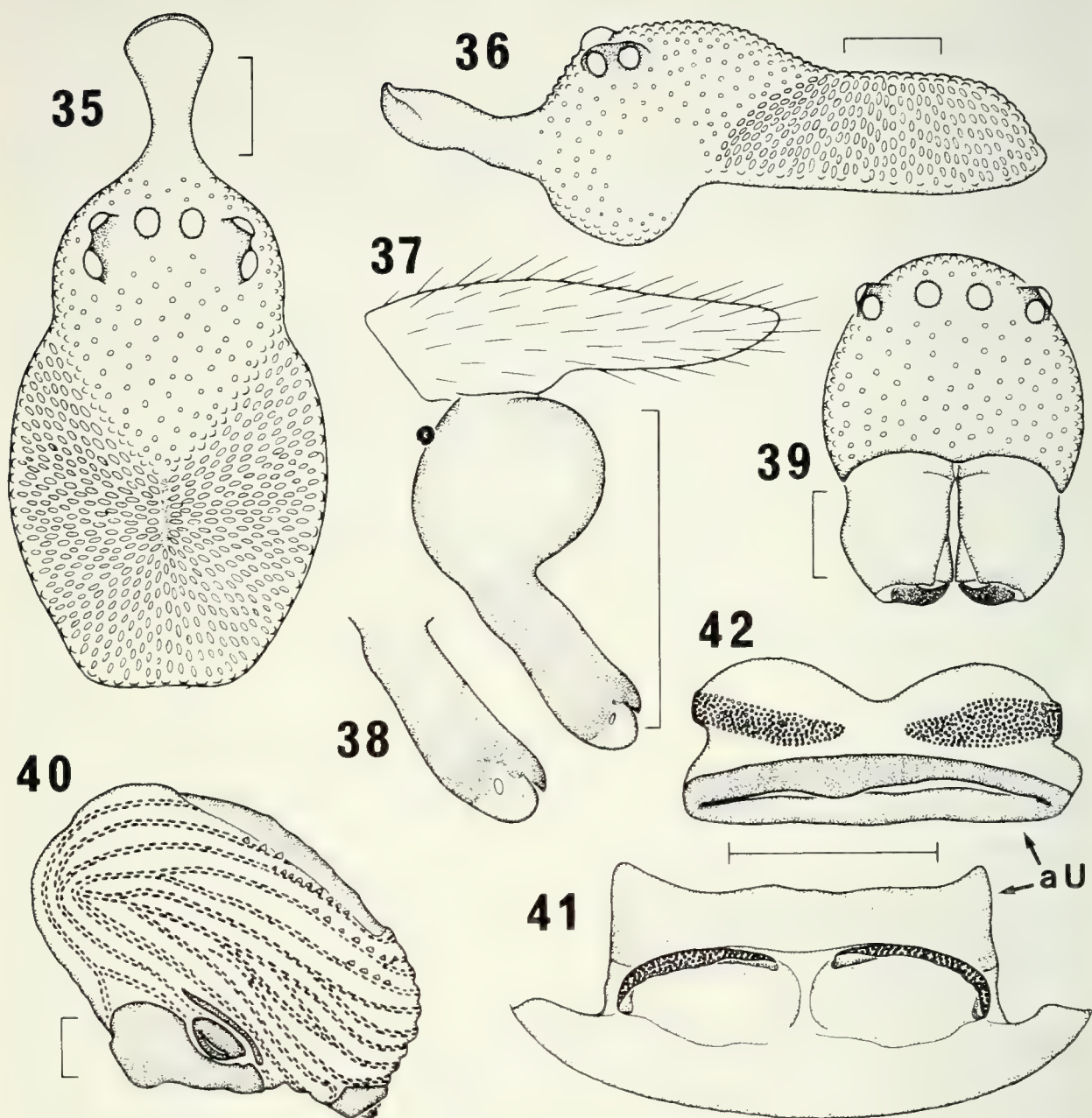
**MALE** (holotype). Colour: sclerotised parts dark reddish-brown, membranous parts of abdomen orange-brown. Total length, including clypeus process, 11.4. Carapace 6.7 long, 3.3 wide. Club-shaped, distally wide process on clypeus, occupying about 1/4 of carapace length (Figs 35, 36). Eye sizes and interdistances: PME 0.31 long, separated by 0.18; ALE 0.29 long, ALE-PLE 0.17; PLE 0.31 long, separated by 1.37; lateral eyes on common tubercle. Chelicerae weak. Labium 0.9 long, 1.2 wide. Sternum 3.3 long, 2.2 wide. Legs 1243. Four fairly long proventral and about 50 small ventral spicules on metatarsus I, 4-5 long ones on proventral tibia I. Paired leg claws with a row of 13-14 teeth on anterior legs, 10-11 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:

	I	II	III	IV	Palp
Femur	5.8	4.5	3.8	4.6	1.2
Patella	2.4	1.9	1.5	1.6	0.7
Tibia	6.0	4.3	2.8	3.8	1.1
Metatarsus	3.6	3.2	2.7	3.6	—
Tarsus	1.5	1.4	1.2	1.4	1.4
Total	19.3	15.3	12.0	15.0	4.4

Apex of cymbium long. Bulb with broad embolus, distally divided into small pointed subterminal lamella and rounded embolus tip (Figs 37, 38).

Abdomen 5.2 long, 3.8 wide. Dorsal scutum 4.6 long, 3.6 wide, with only indistinct mosaic of low tubercles. Pulmonary plate 3.6 long, 3.2 wide, fused to posterior part of spiracular plates; genital region flat. Postgenital plate reduced to a pair of patches. Preanal plate 0.2 long, 0.9 wide. Anal plate 1.0 long, 1.3 wide.

**FEMALE**. As in the male, except for the following. Total length 10.5. Carapace 5.3 long, 3.5 wide; pars cephalica raised and arched, without clypeal process. PME 0.31 long, 0.24 apart; ALE 0.29 long, ALE-PLE 0.11; PLE 0.31 long, 1.66 apart. Chelicerae exceptionally massive (Fig. 39), more developed than in the male and than in females of other species examined. Labium 1.0 long, 1.4 wide. Sternum 3.2 long, 2.2 wide. Legs 1243; metatarsus I with about 50 small spicules, tibia I without. Paired leg claws with a row of 15-16 teeth on anterior legs, 10-13 on posterior legs; unpaired claw with one denticle. Leg and palp measurements:



FIGS 35-42

*Perania coryne* sp. n. Male holotype (35-38), female (39-42). Carapace, dorsal view (35), lateral view (36). Palp, prolateral view (37). Embolus, prodorsal view (38). Carapace and chelicerae, frontal view (39). Abdomen, lateral view (40). Vulva, ventral view (41), anterior view (42). aU anterior collar of uterus externus. Scale lines 1.0 mm (35-40) and 0.5 mm (41, 42).

	I	II	III	IV	Palp
Femur	5.6	4.3	3.5	4.3	1.4
Patella	2.3	1.9	1.4	1.6	0.7
Tibia	5.1	3.8	2.6	3.6	1.1
Metatarsus	3.5	3.1	2.6	3.5	—
Tarsus	1.5	1.4	1.2	1.3	1.6
Total	18.0	14.5	11.3	14.3	4.8

Abdomen 6.6 long, 4.8 wide; several lateral sclerites in posterior half wart-like but not interconnected. Dorsal scutum 4.0 long, 3.1 wide. Pulmonary plate 2.7 long, 3.0 wide, completely separated from spiracular plates; genital region short and quite flat (Fig. 40). Postgenital plate and preanal plate reduced to pairs of paramedian patches. Anal plate 1.1 long, 1.3 wide.

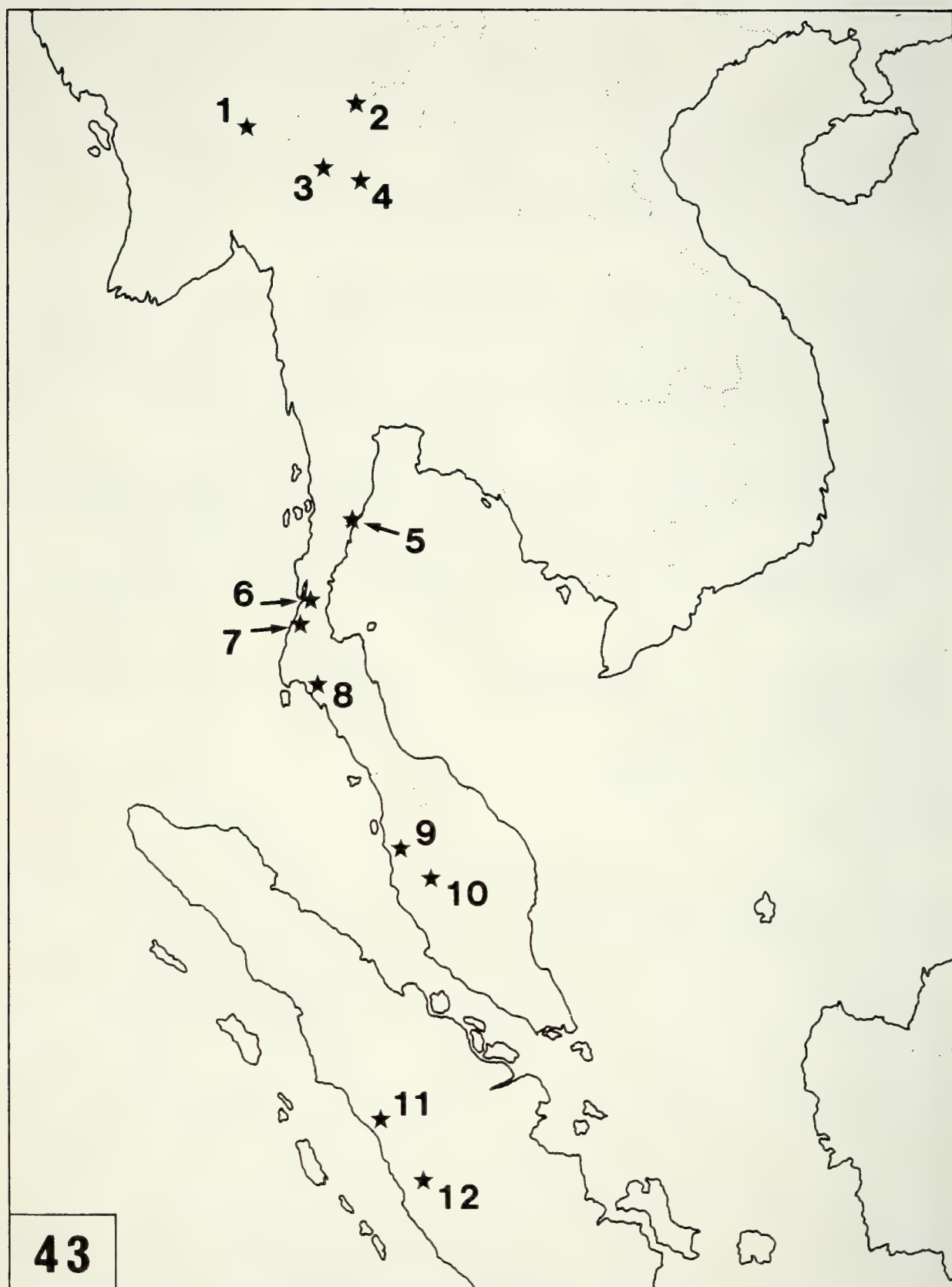
Vulva with a pair of little separated rounded spermathecae bearing narrow bands of pores in the anterior portion (Fig. 42). Anterior collar (aU) wider than pair of spermathecae. Posterior part of vulva with weak lateral sclerotisations (Fig. 41).

**Distribution:** Known only from the Cameron Highlands, peninsular Malaysia (Fig. 43: 10).

**Remark:** No information on the habitat of *P. coryne* sp. n. is available but the spiders most likely occur in montane rain forest prevailing in the Cameron Highlands.

## DISCUSSION

*Perania nasuta* and *P. nasicornis* sp. n. are obviously closely related. Males of both species possess a similar clypeal process (Figs 1, 5-8 and SCHWENDINGER 1989: Figs 6, 8), a fairly small bulb and a long bent embolus with bifurcate apex (Figs 9, 10 and SCHWENDINGER 1989: Figs 24, 25). Females have vulvae with a narrow, relatively long anterior collar and a pair of triangular spermathecae (Figs 13, 14 and SCHWENDINGER 1989: Fig. 17). A similar connexion is seen in *P. cerastes* sp. n. and *P. coryne* sp. n. Males possess a pronounced clypeal process, though different in shape (Figs 26-29 and 35, 36), their bulbs are larger than in the foregoing species and have a fairly short, wide and straight embolus with bifurcate apex (Figs 30-32 and 37, 38). Vulvae with a fairly long, wide anterior collar and rounded spermathecae (Fig. 34 and 41). *Perania robusta* and *P. siamensis* sp. n. resemble each other by males without a clypeal process but with a sexually dimorphous distolateral boss on chelicerae (Fig. 17 and SCHWENDINGER 1989: Fig. 14); bulbs large; embolus straight, with entire apex (Figs 20, 21 and SCHWENDINGER 1989: Figs 26, 27). Vulvae furnished with a short, wide anterior collar and rounded spermathecae (Figs 22-25 and SCHWENDINGER 1989: Fig. 15). Judging from vulval and palpal structures, they are more closely related to *P. cerastes* sp. n. and *P. coryne* sp. n. than to *P. nasuta* and *P. nasicornis* sp. n.



Geographical proximity supports taxonomic relationship between *P. nasuta* and *P. nasicornis* sp. n. and between *P. cerastes* sp. n. and *P. coryne* sp. n. but not so for *P. robusta* and *P. siamensis* sp. n. The latter two species are separated by about 900 km (Fig. 43). Similar forms can be expected to occur in between their distribution areas.

The remaining species cannot be adjoined to those from Thailand and Malaysia at present. In *P. birmanica* (Thorell) (Burma) the male is unknown; the female holotype (in MCSNG, examined) was not dissected to study its vulval structure. Information on the remaining two species (both from Mt. Singalang, Sumatra; not examined) is incomplete as well. The male of *Perania nigra* (Thorell) has a small tooth-like clypeal process, that of *P. picea* (Thorell) lacks it (BOURNE 1980: Figs 6, 12). Their quite small, distinctly U-shaped bulbs with a long sigmoid embolus, however, indicate close relationship with each other. Vulval structures in both species are not yet known.

As large globular bulbs with short emboli are predominant in the Tetra-blemmidae (except in *P. nigra*, *P. picea*, *P. nasuta*, *P. nasicornis* sp. n.) and vulvae with rounded spermathecae are present in all *Perania* females examined<sup>1</sup>, except in *P. nasuta* and *P. nasicornis* sp. n., this is considered the plesiomorphic type within *Perania*. The four exceptions thus are apomorphic and presumably represent two derived species pairs at the northern and southern periphery of the distribution area of *Perania*.

None of the species treated in here have paired processes in the thoracic portion of the carapace, as present in *Mirania armata* (combination according to LETHINEN 1981), which also occurs at Mt. Singalang. Therefore this species appears less closely related to *Perania* than previously assumed (SCHWENDINGER 1989: 579). Further collections in Sumatra may provide new arguments for the evaluation of both genera.

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<sup>1</sup> Apparently also in *P. picea* (BOURNE 1980: Fig. 11; LEHTINEN 1981: Fig. 7). *P. nigra* (BOURNE 1980: Fig. 19; LEHTINEN 1981: Fig. 6) and *P. birmanica* (SCHWENDINGER 1989: Fig. 21).

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FIG. 43

Records of *Perania* in Southeast Asia. Burma: 1 = Mt. Carin Chebà (*P. birmanica*). Thailand: 2 = Doi Angkhang (*P. robusta*); 3 = Doi Inthanon (*P. nasuta*); 4 = Doi Khuntan (*P. nasicornis* sp. n.); 5 = Huay Yang, 6 = Ranong, 7 = Khlong Nakha, 8 = Khao Phanom Bencha (*P. siamensis* sp. n.). Malaysia: 9 = Maxwell Hill (*P. cerastes* sp. n.); 10 = Cameron Highlands (*P. coryne* sp. n.). Indonesia: 11 = Mt. Singalang (*P. nigra*, *P. picea*); 12 = Mt. Kerinci (*P. korinchica* Hogg = *P. picea*, according to LEHTINEN 1981).

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